

*Observations of Jupiter and his Satellites made at Mr. Crossley's Observatory, Bermerside, Halifax, during the Opposition 1899-1900.* By Joseph Gledhill.

Owing to the low altitude of the planet and the bad observing conditions prevailing in the winter and spring of 1899-1900 very few observations could be made. On no occasion was the air steady enough for micrometer measures, and it was but seldom that a good view of the planetary details could be obtained. The structure of the North Tropical Belt was never really well seen; and unfortunately the details and changes of this belt have been for some years among the most interesting features of the planet. As in previous papers, the nomenclature used is that of the British Astronomical Association.

It may perhaps be worth noting that in the diagram on p. 45 of vol. ix. of the *Monthly Notices* the band numbered 1 should be single, not double. This band has for some years been a single straplike band.

The 9-inch Equatorial Refractor (photo-visual), by Messrs. Cooke, of York, was the instrument used. No power higher than 240, and that rarely, was ever used.

#### *The Southern South Temperate Band.*

This band always appeared a faint one, but on several occasions it was broader than the S. Temperate Band, *e.g.* May 15, 11<sup>h</sup>; July 3, 9<sup>h</sup>. At 8<sup>1h</sup> July 26 it was noted as a narrow band. It was never an easy object, and was perhaps never really well seen.

#### *The South Temperate Band.*

This is the grey band so often described as *straplike* in previous papers. In some longitudes it appeared faint, in others a fairly strong grey band—*e.g.* it was faint at 10<sup>1h</sup> May 24, faint and narrow at 9<sup>h</sup> July 3, faint at 9<sup>h</sup> July 10, and at 8<sup>h</sup> July 17; it was narrow and well seen at 8<sup>1h</sup> July 18, narrow at 8<sup>1h</sup> July 26 and at 7<sup>h</sup> 40<sup>m</sup> August 15. It was described as “a well-marked band” at 9<sup>1h</sup> July 17. In some longitudes it was broad and in others narrow, and the place where it changed from broad to narrow was seen on one or two occasions. The place where it changed from a faint to a darker band was on or near the central meridian at 9<sup>h</sup> 5<sup>m</sup> July 16, the darker portion being the western.

#### *The South Tropical Belt.*

This is the fine, double, dark belt, just S. of the equator. As in many past oppositions, so in this, its N. component has had many dark spots on its N. edge. As in past years, too,

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the S. component has exhibited the well-known *p* shoulder, *f* shoulder, and the fainter portion of the belt preceding the *p* shoulder. In some longitudes (*e.g.* May 15 at 11<sup>h</sup>) the N. component was the darkest band on the disc; in others both components were together fainter than the double band just N. of the equator (North Tropical Belt)—*e.g.* May 24, 10<sup>1</sup>/<sub>2</sub><sup>h</sup>, and at 9<sup>h</sup> July 10. In some longitudes the components are well separated—*e.g.* June 17, 9<sup>1</sup>/<sub>2</sub><sup>h</sup>; in others they are almost in contact. The upper (S.) component was the darkest band on the disc at 9<sup>h</sup> July 3. On July 10, 9<sup>h</sup>, the two bands were well separated along the *f* half. On July 18, 8<sup>1</sup>/<sub>2</sub><sup>h</sup>, this southern double band was wider and darker than the N. Tropical Belt, much darker at 8<sup>h</sup> 20<sup>m</sup> August 15, and wider on August 16, 7<sup>h</sup>.

#### *The North Tropical Belt.*

This fine, double, dark band has in some longitudes lost some of its depth of tone since the last opposition. On the other hand it has decidedly gained in warm colour. During the late opposition I was never able to see its intricate structure well. The colour just mentioned was strikingly seen at 10<sup>1</sup>/<sub>2</sub><sup>h</sup> May 24. On July 16, 9<sup>h</sup>, the western half was darker than the eastern half. The numerous bright and dark spots on it were often seen, but rarely well enough for clear description or transit observations. The band as a whole has lost its old sharpness.

#### *The North Temperate Band.*

A faint band was often seen in this region.

#### *The Central or Equatorial Zone.*

Most of the warm colour has left this zone; indeed, it differs very little in point of colour from the rest of the disc.

The brightest zone was always that between the South Tropical Belt and the South Temperate Band.

The Red Spot was not seen on any occasion, owing, no doubt, to the low altitude of the planet and the violent motion.

The faint, narrow, and often interrupted band in the Equatorial Zone was often seen—*e.g.* May 24, 10<sup>1</sup>/<sub>2</sub><sup>h</sup>; June 17, 9<sup>1</sup>/<sub>2</sub><sup>h</sup>; July 3, 9<sup>h</sup>; July 16, 9<sup>h</sup>; July 18, 8<sup>1</sup>/<sub>2</sub><sup>h</sup>; August 15, 7<sup>h</sup> 40<sup>m</sup>.

#### *Bright and Dark Spots.*

Dark spots under the South Tropical Belt were seen on perhaps every night when the planet was visible; and some were seen on the North Tropical Belt. Some bright spots also were seen. Few transits of any value could be obtained owing to the great motion.

July 1, 9<sup>h</sup>. A large, bright spot seen under (to N. of) the S. Tropical Belt; on central meridian about 9<sup>h</sup>.

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July 16, 9<sup>h</sup> 14<sup>m</sup>. A bright gap in the S. Temperate Band was on central meridian.

July 17. Two bright spots or gaps were seen in the N. component of the S. Tropical Belt. One was on the central meridian about 9<sup>h</sup> 17<sup>m</sup>. A dark spot on the N. component of the N. Tropical Belt was on the central meridian about 9<sup>h</sup> 21<sup>m</sup>.

July 18. At about 9<sup>h</sup> 2<sup>m</sup> a bright spot or gap in the S. Temperate Band was on the central meridian.

August 15. At about 8<sup>h</sup> 8<sup>m</sup> a dark spot on the N. edge of the N. component of the S. Tropical Belt was on the central meridian. Two bright gaps in the N. Tropical Belt were also seen. One of them was on the central meridian about 8<sup>h</sup> 17<sup>m</sup>.

August 16. A long, dark spot on the N. edge of the S. Tropical Belt was on the central meridian about 7<sup>h</sup> 43<sup>m</sup>. A bright gap in the S. Temperate Band was seen about the same time to the W. of the central meridian.

August 20. Two bright gaps were seen in the N. Tropical Belt at 7<sup>h</sup> 24<sup>m</sup>.

August 27. A bright gap in the N. component of the N. Tropical Belt was central about 8<sup>h</sup> 8<sup>m</sup>. A little in advance there was another bright gap in the same belt.

#### *Phenomena of Jupiter's Satellites.*

II. Tr. I. External contact at 8<sup>h</sup> 54<sup>m</sup> July 10; visible on the disc till after 9<sup>h</sup> 20<sup>m</sup>. I. Ec. R. First seen, through thin cloud, at 10<sup>h</sup> 25<sup>m</sup> 44<sup>s</sup> July 12. III. Sh. I. Just fully on the disc at 8<sup>h</sup> 43<sup>m</sup> July 17.

II. Oc. R. External contact at 7<sup>h</sup> 27<sup>m</sup>, and II. Ec. D. last seen at 7<sup>h</sup> 38<sup>m</sup> 0<sup>s</sup> August 20.

#### *On the Appearance of Saturn's "Crape" Ring in 1900.*

By E. M. Antoniadi.

Since the publication of the two papers in vol. lix., pp. 498 and 586, of the *Monthly Notices*, the writer has tried to follow the deportment of the dark ring as affected by the varying heights of the Sun and Earth above the plane of the system.

Owing to the fact that the mirror of the great Paris siderostat could not be pointed so as to make a smaller angle than 12° with the vertical, observations of *Saturn* at  $-22\frac{1}{2}^\circ$  of declination were rendered impossible with the large telescope. At Juvisy, with the 9 $\frac{3}{4}$ -inch equatorial, nothing abnormal could be detected until the beginning of autumn. On 1900 October 2 the following peculiarities were noted again and again during the fugitive moments of very sharp seeing :—

I. The "crape" ring seemed of uniform intensity across the planet.